



ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
General Certificate of Education Advanced Level

COMPUTING
PAPER 1

9195/1

NOVEMBER 2015 SESSION

3 hours

Additional materials:
Answer paper

TIME 3 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces provided on the answer paper/answer booklet.

Answer **all** questions.

Write your answers on the separate answer paper provided.

If you use more than one sheet of paper, fasten the sheets together.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

You are reminded of the need for good English and clear presentation in your answers.

This question paper consists of 4 printed pages.

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- 1
 - (a) Outline **four** reasons that have led to the widespread use of electronic mail in business, industry and education. [4]
 - (b) Discuss **two** security problems that have arisen with electronic mail system and indicate what steps can be taken to overcome them. [4]
- 2 Discuss the effects of computerisation of a bank from the user's point of view. [4]
- 3 Chindumu Municipality Council uses computer controlled equipment to monitor and control the quality of drinking water. Sensors are placed in various positions in the equipment to take digital measurements every minute. The computer has been programmed to respond to feed back from the sensors and input from the operator.
 - (a) Identify the data elements that are likely to be captured by the sensors. [2]
 - (b) Describe the situations in which the computer will respond to:
 - (i) feedback
 - (ii) input from the operator
- 4 The introduction of e-learning has brought about change in the educational field.
 - (a) Define the term e-learning. [1]
 - (b) State **two** advantages of using e-learning to students. [2]
- 5
 - (a) List **three** duties carried out by the database administrator in a database management system. [3]
 - (b) Describe the following record types and give an advantage of using the record type:
 - (i) fixed length record
 - (ii) variable length record
- 6
 - (a) Describe an appropriate method of data security for the following applications and in each case, explain how data will be recovered in the event of data loss:
 - (i) a batch payroll system
 - (ii) a realtime airline seat reservation

(b) Distinguish between the following file organisation methods, outlining the most suitable application for each:

(i) serial and direct access

(ii) sequential and indexed sequential

[8]

(c) With reference to the primary key, secondary key and composite key, explain how access to records can be established through the use of these keys.

[3]

7 A clothing shop offers credit facilities to its customers. Its computer system supports online enquiry during the day and batch processing at night.

List any **three** tasks which the shop's computer might perform in batch processing.

[3]

8 (a) Express the following decimal numbers in twos complement binary using 8 bits:

(i) 127

(ii) -27

[2]

(b) Explain using the above example, how hexadecimal can be used as a shorthand for expressing bytes that consist of 8 bits.

[3]

(c) Convert 1011110010_2 to

(i) octal,

(ii) hexadecimal.

[2]

- (d) A sort program inputs an unordered list of names and stores them in memory in the form of a binary tree. Fig. 8.1 represents this data structure with the first six names entered.

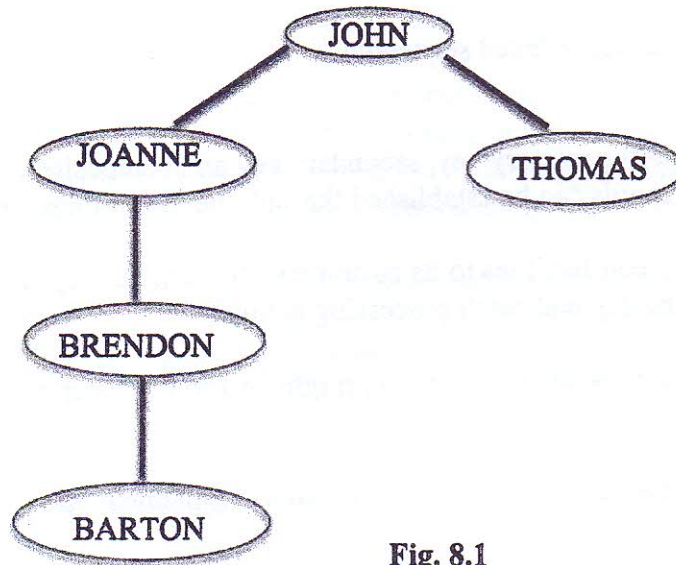


Fig. 8.1

- (i) Define a binary tree.
- (ii) State
 1. the parent of BRENDON,
 2. the name of the root of tree,
- (iii) Copy the diagram and add notes for SUSAN, WINNET, ANNA and JOSEPHINE on the list.

[7]

- (e) Music is often recorded digitally. Write any **four** advantages of this method of representing sound.

[4]

- 9 Officials of Ruthata area health authority have made appointments for all one year old children within the area to be vaccinated. Details of the children and their appointments are maintained in a computer file.

- (a) Explain how a word processor could be used to generate personalised letters to send to families to give details of the appointments.

[3]

- (b) Continuous use of the computer by data capture clerks can cause some health problems for the operators.

(i) Give any **two** healthy problems that can arise due to continuous use of computers.

(ii) List any **two** precautions that may be used to prevent the above risks.

[4]

- 10 (a) Describe how each of the following methods is used to transfer data into a computer and in each case give an appropriate application.

(i) MICR (Magnetic Ink Character Recognition),

(ii) OCR (Optical Character recognition).

[4]

- (b) Use of magnetic tape is still widespread although large disk drives are now available for computer systems. Describe **two** distinct uses of magnetic tape.

[4]

- 11 (a) Explain the meaning of the term intranet.

[2]

- (b) Many colleges are changing to intranet.

State **three** benefits to a college of setting up an intranet.

[3]

- (c) Explain the meaning of the following access methods:

(i) CSMA/CD – Carrier Sense Multiple Access with Collision Detection

(ii) token passing

[2]

- (d) (i) Describe the Von Nuemann architecture.

(ii) Explain what the accumulator holds and how the contents change during the fetch-execution cycle.

(iii) Explain what the program counter (PC) holds and how the contents change during fetch-execute cycle.

[9]

- 12 A large magazine concern has a multi-access system which supports 200 terminals. As the number of users increase there is a gradual degradation of performance which rapidly worsens as the number of the users increase to 150.

Interpret the phrase “*gradual degradation of performance*” and suggest how it could be remedied.

[3]